Preferred book formats in an academic medical center*

Lynda J. Hartel, MLS, AHIP; Fern M. Cheek, AMLS, AHIP

See end of article for authors' affiliations.

DOI: 10.3163/1536-5050.99.4.011

Learning more about when and why medical students, faculty, and clinical staff use e-books, as opposed to print books, is an expanding area of research for health sciences librarians. Several studies have highlighted the heavy use of health sciences titles in campus e-book collections [1–5] and the book format preferences of medical and other health sciences students [2, 6, 7]. A recent case study by Shurtz and von Isenburg is one of the first to explore e-book use in both health sciences educational and clinical settings [8].

* This study was supported by a 2007 Medical Library Association Research, Development, and Project Demonstration Grant.

Supplemental Table 1 and Appendixes A, B, C, and D are available with the online version of this journal.

As of June 2010, The Ohio State University (OSU) Prior Health Sciences Library offered more than 6,000 health and life sciences e-books. E-book usage has increased every year driven by Core25 Books, a browsable e-book promotions tool developed at the Prior Library, the ability to link to e-book chapters via the online course management system, and the distribution of the latest in mobile device technologies by OSU to incoming health sciences students and residents. During recent patron-driven e-book selection projects conducted at OSU, medical and life sciences books ranked at the top of subjects selected. Even with the growing emphasis on e-books at OSU, many questions remained about format usability and customer preferences.

This exploratory study proposed to: (1) identify the book format preferences of customers in education, research, and patient care settings of an academic health sciences center; (2) discover factors that influence customer format selection; and (3) offer suggestions to librarians involved in the selection and delivery of health sciences books.

METHODS

A convenience sample of sixteen participants from OSU—two faculty members from the college of medicine, two faculty members from the college of nursing, four nurses, four medical residents, and four medical students—were recruited via email communications to campus email discussion lists asking for volunteers to participate in an e-book study in early–mid 2009. The email indicated that the print books used in the study as well as gift cards would be offered as incentives. Fifty-five individuals responded to the request, and sixteen were chosen, representing a cross-section of primary library customers. Participants were not required to be experts in the use of e-books but were expected to be familiar with handheld devices and online tools. After completing a baseline survey and introductory interview, participants completed a question-and-answer exercise using three book formats—print, web-based, and handheld—and then took part in a closing discussion and completed a post-study survey.

Exercise questions were compiled from two sources: assignments from an OSU clinical skills immersion class and a study guide for the United States Medical Licensing Examination [9].The survey and exercises were pilot tested on two Prior Library staff members to ensure feasibility. During the pilot test, it was determined that the various formats used, combined with the complexity of the questions used in the assignment, did not warrant controlling the order in which the formats were searched during the study exercise. There appeared to be little in the way of knowledge transfer from one book format to another.

Print books, web-based books, and e-books preinstalled on a Palm TX handheld device (the device being issued in 2009 to OSU medical students and residents) were provided to study participants. The selected titles, based on availability in all three formats, were *Diagnostic and Statistical Manual of Mental Disorders: DSM-IV-TR, Ferri's Clinical Advisor, Harrison's Principles of Internal Medicine, Manual of Laboratory and Diagnostic Tests,* and *The Washington Manual of Medical Therapeutics.* Web-based versions were accessed through MD Consult, Ovid, and STAT!Ref, and handheld versions were provided by SkyScape. Participants' prior experience with the titles used in the study was not a consideration.

Prior to beginning the study, participants met with the authors to review study requirements and compete a baseline survey (Appendix A, online only) to measure prior use of e-books. They received handheld devices preloaded with the study books along with the print books. Participants not familiar with the Palm TX device were offered a demonstration and instructed to explore the device on their own.

Participants were then asked to answer a series of questions as if they were caring for patients or studying for examinations. Ten identical questions (Appendix B, online only) were given to each participant, and participants were instructed to spend a maximum of 10 minutes on each question using books in all 3 formats, completing the entire exercise in 2 weeks. After searching for answers to each question, participants recorded the books, page numbers, relevant chapters or sections used to answer the question, and the time needed to answer each question to satisfaction (Appendix C, online only). Participants also rated each format overall for ease of navigation, readability, and searching efficiency on a 5-point Likert scale, where 5 was ''Strongly agree'' and 1 was ''Strongly disagree.''

In the study's final phase, participants met with the authors, turned in their exercise forms, completed an exit survey (Appendix D, online only), and summarized their study experiences.

RESULTS

Baseline survey

All 16 participants completed the baseline and exit questionnaires (Table 1, online only). At baseline, 11 participants (68%) reported owning a handheld device. Fourteen (87.5%) indicated they were aware that the library offered e-books. The 2 who were not aware of the e-book collection were both nurses, 1 nurse faculty member and 1 clinical nurse. Nine (56.2%) participants reported they had previously used e-books, and 1 participant was unsure. Of these 9, all had used web-based e-books and 3 had used handheld e-books. Six participants found e-books easy to use, and 3 were unsure. All 4 clinical nurses reported no previous use of e-books. The reasons reported for not using e-books were a lack of awareness and a preference for using journals.

Exercise findings

Details of the responses to the study exercise are shown in Tables 2 and 3. Overall, the print format was rated the most intuitive and easy to navigate as

Table 1
Overall level of satisfaction by status/format

		These books are intuitive and easy to navigate			This format satisfies my needs more than other formats		
Status	**Format**	**Mean**	**Standard deviation**	**n**	**Mean**	**Standard deviation**	**n**
Clinical nurse	Web-based	4.00	0.82	4	4.00	1.41	4
	Handheld	2.75	0.96	4	1.75	0.96	4
	Print	3.75	1.89	4	4.00	1.16	4
	Total	3.50	1.31	12	3.25	1.55	12
Nursing faculty	Web-based	4.50	0.71	2	4.00	1.41	2
	Handheld	4.00	1.41	2	2.00	NA	1
	Print	5.00	0.00	2	4.50	0.71	2
	Total	4.50	0.84	6	3.80	1.30	5
Physician faculty	Web-based	2.50	0.71	2	1.50	0.71	2
	Handheld	3.50	0.71	2	3.50	0.71	2
	Print	3.50	0.71	2	3.50	0.71	2
	Total	3.17	0.75	6	2.83	1.17	6
Resident	Web-based	3.25	0.96	4	3.75	1.26	4
	Handheld	3.25	0.96	4	2.75	0.96	4
	Print	4.50	0.58	4	3.75	0.50	4
	Total	3.67	0.99	12	3.42	1.00	12
Student	Web-based	3.50	1.00	4	2.75	0.50	4
	Handheld	3.75	1.26	4	3.00	0.82	4
	Print	4.75	0.50	4	3.50	1.29	4
	Total	4.00	1.04	12	3.08	0.90	12
Total	Web-based	3.56	0.96	16	3.31	1.30	16
	Handheld	3.38	1.03	16	2.60	0.99	15
	Print	4.31	1.08	16	3.81	0.91	16
	Total	3.75	1.08	48	3.26	1.17	47

well as most satisfying. Participants found the handheld format to be the least intuitive and easy to navigate as well as the least satisfying. Participants reported that it took the least amount of time, on average, to find answers in print format, followed by web-based, with the handheld format taking slightly longer than the web-based format. Nurse faculty members spent the least amount of time answering the questions across all formats with an average time of 1.98 minutes per question. Physician faculty took the most time answering questions across all formats with an average of 4.34 minutes per question.

When asked which format satisfied their needs most, students and nurse faculty indicated print, residents and clinical nurses indicated print and online formats equally, and physician faculty indicated print and handheld formats equally.

The exercise form provided space for comments, and comments regarding the handheld format focused on two issues: navigation complexity and price. Residents and clinical nurses reported problems searching for specific information using the handheld device. Several participants noted concerns about the price of subscriptions and devices with one nurse faculty member recommending this format be left to personal purchase. With respect to web-based e-books, participants noted frustrations adapting to different provider platforms and stated a desire to have both print and web-based books available. Regarding print books, participants noted the inconvenience of carrying large books but a preference for using print books when reading large amounts of text.

Exit survey

At the exit meetings, all participants noted that study activities provided an opportunity to learn about e-books and discover their personal and professional format preferences. Presumably because their opinions were informed by their participation in the study exercise, participants' responses changed between baseline and exit surveys (Table 1, online only). At baseline, regarding purpose of e-book use, 7 (43.8%) participants reported using e-books for clinical care and 6 (37.5%) reported using e-books for course readings. At the exit survey, 15 (93.8%) participants indicated clinical care was also the most-anticipated reason for use, with 12 (75.0%) indicating they would anticipate using e-books as a general reference tool and

Table 2
Minutes to find an answer by format/status

Format	**Status**	**Mean**	**Standard deviation**	**n**
Web-based	Clinical nurse	3.36	2.76	4
	Nursing faculty	2.00	1.05	2
	Physician faculty	5.45	2.96	2
	Resident	3.57	1.97	4
	Student	3.00	1.84	4
	Total	3.42	2.38	16
Handheld	Clinical nurse	4.82	4.01	4
	Nursing faculty	1.61	1.04	2
	Physician faculty	3.63	2.81	2
	Resident	4.02	3.03	4
	Student	2.50	2.51	4
	Total	3.51	3.17	16
Print	Clinical nurse	3.14	2.23	4
	Nursing faculty	2.32	1.67	2
	Physician faculty	3.90	2.79	2
	Resident	3.82	2.74	4
	Student	1.70	1.02	4
	Total	2.94	2.31	16
Total	Clinical nurse	3.78	3.17	4
	Nursing faculty	1.98	1.30	2
	Physician faculty	4.34	2.92	2
	Resident	3.81	2.61	4
	Student	2.40	1.95	4
	Total	3.29	2.66	16

only 5 (31.2%) indicating they would anticipate using e-books for course readings. With respect to setting of e-book use, baseline survey results indicated that 6 (37.5%) participants had used them in academic settings, while only 2 (12.5%) indicated they previously used e-books in a hospital setting. At the exit survey, 15 (93.8%) participants expected to use e-books in hospital settings, while 11 (68.8%) participants expected to use e-books in academic settings. All participants reported they were likely or very likely to use e-books after having used them in this study.

The exit survey asked participants to indicate the format they would choose to use in the future for each of the 5 titles used in the exercise. Fourteen participants offered the following responses: (1) *DSM-IV-TR,* 5 of 14 predicted future use of the print and handheld formats and 4 of 14 predicted use of the web-based; (2) *Ferri's Clinical Advisor,* 6 of 14 predicted use of the handheld, 5 of 14 web-based, and 3 of 14 print; (3) *Harrison's,* 8 of 14 predicted use of the web-based, 7 of 14 print, and 1 of 14 handheld; (4) *Manual of Laboratory and Diagnostic Tests,* 6 of 14 predicted use of both the handheld and the web-based formats and 2 of 14 predicted print use; and (5) *Washington Manual,* 7 of 14 predicted use of print, 4 of 14 predicted use of online, and 3 of 14 predicted handheld use.

DISCUSSION

This study supports the notion that there is a time and place for print as well as e-book formats. Similar to other findings, participants in this study found the electronic formats best for quick searches and brief reading and the print format more conducive to reading large amounts of material [2, 7, 10].

An initial assumption was that medical students and residents would prefer electronic formats because they have grown up using them, but this was only partially supported. The authors also predicted that health care professionals would prefer print books because of their comfort and experience with using this format, and this was also only partially supported. As to overall satisfaction, all groups indicated that print books satisfied their needs as much or more than the other formats. This finding suggests that libraries should continue to provide print books as well as e-books during this time of transition.

Additional studies involving larger, random samples of participants would strengthen the evidence in this field of research. Other areas that warrant future research include conducting follow-up communications with research study participants for collecting information on the long-term use of e-books, exploring the impact of faculty and department leadership preferences and expectations regarding e-book use by their students and staff, and investigating which e-book education and communication techniques reach customers most successfully.

Study limitations

The authors' limited resources combined with the demands on participant schedules necessitated the small sample size, which limits the extent to which the results can be generalized to other populations. Web-based platforms were chosen for this study based on the required availability of titles in all three formats. The study's findings mght not apply to all commercial platforms. The order in which participants searched each format during the exercise was not controlled, and this might have resulted in some bias. Complications related to license rights, access to the handheld hardware and software, and life-changing events among some of the participants slowed the completion of the study.

CONCLUSION

In the months since the authors conducted this study, interest in e-books and e-book readers has increased at OSU. In a very short time, e-book access devices have evolved from the popular Palms used in this study to the iPod, Android, Kindle, Nook, and most recently, the iPad. The authors theorize that most customers will soon come into the academic and health settings having personally used an e-book reader of one type or another. The ways in which libraries provide and promote e-book access is crucial. Library promotions, communications, and educational sessions must regularly highlight e-book resources, features, and functionality [11].

Companies such as Amazon, Barnes & Noble, Apple, and Google are revolutionizing how e-books are bought and read. Four trends are certain for the foreseeable future: (1) e-book publishing will continue to grow; (2) the evolution of e-book access methods and devices will continue; (3) licensing and archival challenges will persist in libraries; and (4) a time and place for print book usage will remain, albeit a diminished place for many customers. It will be exciting to see how these tools and resources will be utilized by health sciences populations and adapted by health sciences publishers.

ACKNOWLEDGMENTS

The authors express their gratitude to Jeni Squiric, OSU Statistical Consulting Service, for her assistance with statistical analysis; Jeffry Hartel and Kalyani Parthasarathy for their editorial suggestions; and Matthews Medical Books and Skyscape for their study support. We also thank the Medical Library Association and OSU Libraries Committee on Faculty Benefits, Privileges, and Responsibilities for funding the research study.

REFERENCES

1. Littman J, Connaway L. A circulation analysis of print books and e-books in an academic research library. Libr Resour Tech Serv. 2004 Oct;48(4):256–62.
2. Williams MG, Dittmer A. Textbooks on tap: using electronic books housed in handheld devices in nursing

clinical courses. Nurs Educ Perspect. 2009 Jul–Aug;30(4):220–5.
3. Langston M. The California State University e-book pilot project: implications for cooperative collection development. Libr Collect Acquis Tech Serv. 2003 Spring;27(1):19.
4. Bailey TP. Electronic book usage at a master's level I university: a longitudinal study. J Acad Libr. 2006 Jan;32:52–9.
5. Ugaz AG, Resnick T. Assessing print and electronic use of reference/core medical textbooks. J Med Libr Assoc. 2008 Apr;96(2):145–7. DOI: 10.3163/1536-5050.96.2.145.
6. Tannery NH, Foust JE, Gregg AL, Hartman LM, Kuller AB, Worona P, Tulsky AA. Use of web-based library resources by medical students in community and ambulatory settings. J Med Libr Assoc. 2002 Jul;90(3):305–9.
7. Appleton L. The use of electronic books in midwifery education: the student perspective. Health Info Libr J. 2004 Dec;21(4):245–52.
8. Shurtz S, von Isenburg M. Exploring e-readers to support clinical medical education: two case studies. J Med Libr Assoc. 2011 Apr;99(2):110–7. DOI: 10.3163/1536-5050.99.2.002.
9. Feibusch KC. Prescription for the boards: USMLE step 2. 3rd ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2002.
10. Strother EA, Brunet DP, Bates ML, Gallo JR 3rd. Dental students' attitudes towards digital textbooks. J Dent Educ. 2009 Dec;73(12):1361–5.
11. Berg SA, Hoffmann K, Dawson D. Not on the same page: undergraduates' information retrieval in electronic and print books. J Acad Libr. 2010 Nov;36(6):518–25.

AUTHORS' AFFILIATIONS

Lynda J. Hartel, MLS, AHIP, hartel.642@osu.edu, Associate Director and Assistant Professor; **Fern M. Cheek, AMLS, AHIP,** cheek.27@osu.edu, Research Librarian and Assistant Professor, Prior Health Sciences Library and Center for Knowledge Management, The Ohio State University, 376 West Tenth Avenue, Columbus, OH 43210

Received January 2011; accepted May 2011